

A decorative graphic on the left side of the slide, consisting of a network of light blue lines and small circles, resembling a circuit board or a stylized tree structure, set against a dark blue gradient background.

STACKS AND QUEUES

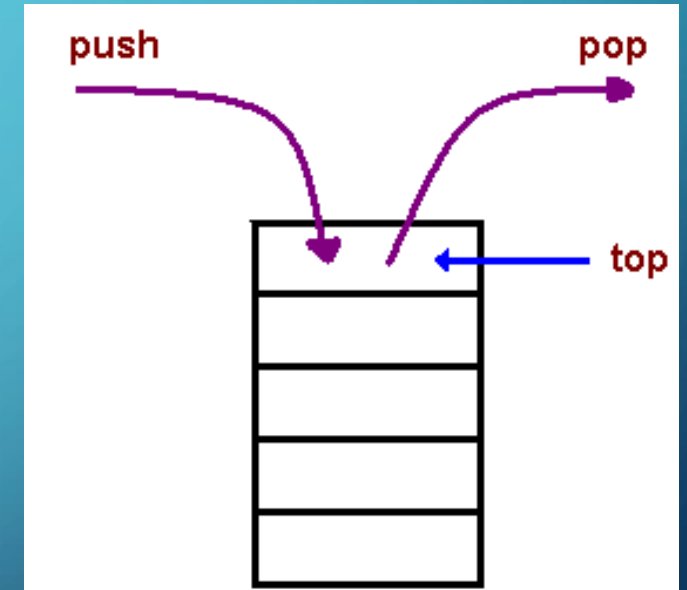
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ARRAYS

An array is a *random access* data structure, where each element can be accessed directly and in constant time

STACKS

A stack is a container of objects that are inserted and removed according to the last-in first-out (LIFO) principle. In the pushdown stacks only two operations are allowed: **push** the item into the stack, and **pop** the item out of the stack. A stack is a limited access data structure - elements can be added and removed from the stack only at the top. **push** adds an item to the top of the stack, **pop** removes the item from the top. A helpful analogy is to think of a stack of books; you can remove only the top book, also you can add a new book on the top.



HANDSON WITH STACKS

WRITE A PROGRAM TO REVERSE THE CONTENT OF A WORD USING STACK

CHECK WHETHER THE WORD IS A PALINDROME OR NOT

WRITE A PROGRAM TO BACKTRACK THE ROUTE DURING TREK THROUGH THE FOREST.

QUEUES

A queue is a container of objects (a linear collection) that are inserted and removed according to the first-in first-out (FIFO) principle. An excellent example of a queue is the queue at a Railway station or board the train

New additions to a line made to the back of the queue, while removal (or serving) happens in the front. In the queue only two operations are allowed **enqueue** and **dequeue**. Enqueue means to insert an item into the back of the queue, dequeue means removing the front item. The picture demonstrates the FIFO access. The difference between stacks and queues is in removing. In a stack we remove the item the most recently added; in a queue, we remove the item the least recently added.

APPLICATION OF QUEUES

Widely used in all web
servers

The background is a blue gradient with decorative white circuit-like lines in the corners. These lines consist of straight segments and small circles, resembling a stylized electronic circuit board.

HANDSON WITH QUEUES